WHAT IS CLAIMED IS:

1. A deployment mechanism for deploying a filamentous endovascular device having a proximal end, comprising:

an elongate, flexible, hollow deployment tube having an open proximal end, a distal section terminating in an open distal end, and a lumen defined between the proximal and distal ends;

a retention sleeve fixed to the distal section of the deployment tube and extending a short distance distally past the distal end of the deployment tube; and

a coupling element attached to the proximal end of the endovascular device and releasably held in a non-fluid-tight engagement within the retention sleeve near the distal end of the deployment tube so as to be separable from the retention sleeve in response to fluid pressure applied to the coupling element through the lumen and the distal end of the deployment tube.

2. The deployment mechanism of Claim 1, wherein the retention sleeve is made of a polymer.

3. The deployment mechanism of claim 2, wherein the polymer is selected from the group consisting of PET, a fluoropolymer, polyimide, polyamide, polyurethane, polyolefin, and block copolymers.

4. The deployment mechanism of claim 1, wherein the retention sleeve is resistant to radial expansion.

5. The deployment mechanism of Claim 1, wherein coupling element includes an exterior surface and a purge passage that is formed in the exterior surface of the coupling element.

6. The deployment mechanism of Claim 5, wherein the purge passage is helical.

7. The deployment mechanism of Claim 5, wherein the purge passage is dimensioned to provide a substantial restriction to the flow therethrough of a liquid having a viscosity greater than or approximately equal to 2 cP.

8. The deployment mechanism of claim 1, wherein the coupling element is pivotally attached to the proximal end of the endovascular device.

9. The mechanism of claim 1, further comprising a deployment sensing system that provides an indication of the separation of the endovascular device from the retention sleeve.

10. The mechanism of claim 9, wherein the deployment sensing system comprises:

a pressure sensor in the deployment tube, the pressure sensor generating a first electrical signal indicative of the pressure in the deployment tube;

a detection circuit that receives the first signal and that generates a second electrical signal in response to a drop in pressure associated with the separation of the endovascular device from the retention sleeve; and

an indicator that provides an audible, visible, or tactile indication in response to the second signal.

11. The deployment mechanism of claim 9, wherein the coupling element includes an electrically conductive material, and wherein the deployment sensing system comprises:

first and second electrodes located in the retention sleeve so as to establish electrical contact with the coupling element when the coupling element is held within

the retention sleeve;

a circuit in which an electrical current is generated that flows through the first and second electrodes and the coupling element, and that generates an electrical signal in response to a change in an electrical parameter in the circuit associated with the separation of the coupling element from the retention sleeve; and

an indicator that provides an audible, visible, or tactile indication in response to the electrical signal.

12. The deployment mechanism of claim 11, wherein the electrical parameter is selected from the group consisting of resistance and current.

13. A method of deploying a filamentous endovascular device into a target vascular site, comprising the steps of:

(a) providing an elongate, flexible, hollow deployment tube having an open proximal end, a distal section terminating in an open distal end, and a lumen defined between the proximal and distal ends;

(b) providing a filamentous endovascular device having a proximal end and a coupling element attached to the proximal end, the coupling element being releasably attached to the deployment tube adjacent the open distal end thereof, the coupling element being formed with a purge passage

(c) purging air from the lumen by introducing a purging liquid through the lumen with a pressure sufficient to displace air from the lumen through the purge passage but not sufficient to separate the endovascular device from the deployment tube;

(d) introducing the endovascular device intravascularly to the target vascular site while it is attached to the deployment tube; and

(e) injecting a liquid into the proximal end of the lumen at a pressure of at least about 30 kg/cm^2 to separate the endovascular device from the deployment tube in response to the liquid pressure applied to the coupling element through the open

distal end of the deployment tube.

14. The method of claim 13, further comprising the step of:

(f) generating an electrical signal in response to the separation of the endovascular device from the deployment tube.

15. The method of claim 13, wherein the purge passage is dimensioned so as to provide a substantial restriction to the flow therethrough of a liquid having a viscosity greater than or equal to a predetermined viscosity, and wherein the injecting step comprises the step of injecting a liquid having a viscosity greater than the predetermined viscosity through the lumen.

16. The method of Claim 15, wherein the predetermined viscosity is approximately 1 cP, and wherein the relatively high viscosity liquid is a contrast agent having a viscosity of at least about 2 cP.

17. The method of Claim 13, wherein the coupling element is releasably held by a retention sleeve fixed to the distal section of the deployment tube.

18. The method of Claim 17, wherein the retention sleeve is not substantially expanded in the radial direction during the injection step.

19. The method of Claim 13, wherein the injected liquid in the injecting step applies pressure directly to the coupling element.

20. The method of Claim 13, wherein coupling element has an exterior surface, and wherein the purge passage is formed in the exterior aurface of the coupling element.

21. The method of Claim 20, wherein the purge passage is helical.

22. The method of claim 13, wherein the step of generating an electrical signal includes the steps of

(1) detecting a drop in pressure in the deployment tube when the endovascular device separates from the deployment tube; and

(2) generating the signal in response to the detected drop in pressure.

23. The method of claim 13, wherein the step of generating an electrical signal includes the steps of:

(1) providing an electrical circuit that includes the coupling element; and

(2) generating the signal in response to a change in an electrical parameter in the circuit.

24. The method of claim 23, wherein the electrical parameter is selected from the group consisting of resistance and current.